Confidential ☐ **Yes** ☐ **No** **Port/Terminal** **POLA/Terminal X**

CALIFORNIA AIR RESOURCES BOARD AT-BERTH OCEAN-GOING VESSELS REGULATION TERMINAL PLAN

FORM 1
GENERAL INFORMATION

Table 1

General Information		
Port POLA/POLB		**Date** 1/21/09
Terminal Name Terminal X		
Total Number of Berths Two Berths		
Address 17 Port Way		
City Fiction	**State** California	**Zip**
Terminal Operator Seaside Operations		
Contact Person Grant Chin		Title
Phone 916-327-5602	FAX	**Email** gchin@arb.ca.gov

Check the box next to the Forms submitted in this package

	Check
Grid-Based Shore Power Option Only – Reduced Onboard Power Option – FORM 2	X
Grid-Based Shore Power – Either Compliance Option Terminal/Utility Power Requirements – FORM 3	X
Grid-Based Shore Power Option – Equivalent Emissions Reduction Option – FORM 4	X
Distributed Generation Option – Equivalent Emissions Reduction Option – FORM 5	X
Shore-Side Alternative Control Option – Equivalent Emissions Reduction Option – FORM 6	
Vessel-Side Alternative Control Option – Equivalent Emissions Reduction Option – FORM 7	X
Schedule for Implementation – FORM 8	X

Confidential ☐ **Yes** ☐ **No** **Port/Terminal** **POLA/Terminal X**

FORM 2
GRID-BASED SHORE POWER – REDUCED ONBOARD POWER OPTION

Table 2A

2014 Estimate the categories of Vessels and Operators that are anticipated to visit this Terminal, how often they may visit, those that will use shore power, the number of visits that will use shore power, the typical berthing times and annual power use

Vessel Operator	Vessel Category	Number of Vessels	Number of Vessel Visits	Number of Vessels that Will Use Shore Power	Number of Vessel Visits That Will Use Shore Power	Average Berthing Time, Hr	Total Estimated Annual Power Use, MW-Hr
North Trails	Container	20	66	6	36	30	2,200
Giant	Container	1	1	0	0	NA	NA
Total		21	67	6	36		2,200

Table 2B

2017 Estimate the categories of Vessels and Operators that are anticipated to visit this Terminal, how often they may visit, those that will use shore power, the number of visits that will use shore power, the typical berthing times and annual power use

Vessel Operator	Vessel Category	Number of Vessels	Number of Vessel Visits	Number of Vessels that Will Use Shore Power	Number of Vessel Visits That Will Use Shore Power	Average Berthing Time, Hr	Total Estimated Annual Power Use, MW-Hr
North Trails	Container	22	75	11	53	30	3,500
Giant	Container	2	2	0	0	NA	NA
Total		24	77	11	53		3,500

Confidential ☐ **Yes** ☐ **No** **Port/Terminal** **POLA/Terminal X**

FORM 2
GRID-BASED SHORE POWER – REDUCED ONBOARD POWER OPTION

Table 2C

2020 Estimate the categories of Vessels and Operators that are anticipated to visit this Terminal, how often they may visit, those that will use shore power, the number of visits that will use shore power, the typical berthing times and annual power use

Vessel Operator	Vessel Category	Number of Vessels	Number of Vessel Visits	Number of Vessels that Will Use Shore Power	Number of Vessel Visits That Will Use Shore Power	Average Berthing Time, Hr	Total Estimated Annual Power Use, MW-Hr
North Trails	Container	25	82	15	65	30	4,500
Giant	Container	2	2	0	0	NA	NA
Total		27	84	15	65		4,500

Confidential ☐ **Yes** ☐ **No** **Port/Terminal** **POLA/Terminal X**

NOTE: Please complete FORM 3 if installing the infrastructure for Grid-Based Shore Power following the Reduced Onboard Power Option and/or the Equivalent Emissions Reduction Option.

FORM 3
GRID-BASED SHORE POWER

Table 3A

Terminal Information - Grid-Based Shore Power			
		Yes	**No**
Is the power available now to the Terminal adequate to service the compliance requirements? *Please enter NA for Not Applicable if grid-based shore will not be used by 2010 or 2012.	**2010***	**X**	
	2012*	**X**	
	2014	**X**	
	2017	**X**	
	2020		**X**
Describe the current terminal electrical system and include a "simplified schematic"—see instructions and Appendix C for an example. If necessary, attach additional sheets and indicate reference to Table 3A.			
Chart 1 describes the terminal's current electrical system. Terminal X currently has 50 MW available at the facility. The peak power required by the facility varies between 25 to 35 MW and the facility's annual usage for the last calendar year (2007) was 85,000 MW-hr. A medium voltage line comes in at the terminal substation and all the lines within the terminal are low voltage.			

Confidential ☐ **Yes** ☐ **No** **Port/Terminal** **POLA/Terminal X**

FORM 3
GRID-BASED SHORE POWER

Table 3B

Terminal Information - Grid-Based Shore Power					
*Please enter NA for Not Applicable if grid-based shore will not be used by 2010 or 2012.	**2010***	**2012***	**2014**	**2017**	**2020**
How many berths are anticipated to need modifications to meet the regulation requirements?	1	0	1	0	0
How many new berths are expected to be constructed and have shore power capability?	0	0	0	0	1
Estimate the maximum electrical capacity (MW) for each berth	7.5 mva	7.5 mva	7.5 mva	7.5 mva	7.5 mva
Estimate the maximum electrical capacity (MW) for the Terminal	50	50	50	50	70
Identify the improvements necessary to provide power to the berth(s) (i.e. schematics, additional conduit, additional vaults, electrical safety equipment, etc.). If necessary, attach additional sheets and indicate reference to Table 3B.					
2010*					
Chart 2 provides a schematic for the revisions to the terminal such that affected fleets are able to satisfy the regulation's 2010 requirements. The changes are shown in a dash-line format. The facility has adequate power to provide power for shore power for two berths. The changes to the terminal's electrical system to satisfy the 2010 requirement include adding a new terminal substation, adding a low voltage line from the new substation to berth 2, and adding four vaults and associated switchgear for berth 2. The potential peak power demand in 2010, including shore power, is expected to increase to between 30 and 40 MW—the terminal currently has 50 MW available.					
2012*					
No revisions will need to be made to the terminal for fleets to satisfy the 2012 requirements					
2014 Chart 3 provides a schematic for the revisions to the terminal to satisfy the regulation's 2014 requirements. The changes to the terminal's electrical system to satisfy the 2014 requirement include extending the low voltage line from berth 2 to berth 1 such that the terminal will have two shore power ready berths. Four vaults and associated switchgear will also be added to berth 1. The potential peak power demand in 2014, including shore power, is expected to increase to between 35 and 45 MW—the terminal currently has 50 MW available.					
2017 No additional modifications are needed to satisfy the 2017 requirements					
2020 By 2020, as shown in Chart 4, an additional berth will be added to the terminal to handle the increased ship traffic. As part of this expansion, additional power will be brought in to provide the additional power needs of the new berth and associated equipment, including shore power—see discussion in Table 3D. The terminal will then have 70 MW available. The electrical infrastructure (cabling, vaults, and switchgear) for shore power will be added to the berth as part of the development of the new berth. The shore power terminal substation will be modified to accept the additional power. The potential peak power, including shore power, increases to between 50 to 60 MW.					

Confidential ☐ **Yes** ☐ **No** **Port/Terminal** **POLA/Terminal X**

FORM 3
GRID-BASED SHORE POWER

Table 3C

Utility/Port Information - Grid-Based Shore Power			
		Yes	**No**
Is the power available now to the Port adequate to service the compliance requirements? *Please enter NA for Not Applicable if grid-based shore will not be used by 2010 or 2012.	**2010***	**X**	
	2012*	**X**	
	2014	**X**	
	2017		**X**
	2020		**X**
Please describe the adequacy of the current power availability with respect to shipping activity power needs to the Port and Terminal(s) and include a "simplified schematic"—see instructions. Attach any additional sheets and indicate reference to Table 3C.			
The utility B street substation provides the power to the port, as shown in Chart 7. The B street substation serves two port substations—the North Substation and the South Substation, which serves Terminal X and two other terminals. As shown in Chart 5, the three terminals are currently served with a medium voltage line. The current system is able to provide the necessary power for Terminal X to satisfy the 2010, 2012, and 2014 regulatory requirements.			
Beginning in 2017, the port's electrical system cannot provide enough power for all terminals at the port to support the expected shore power needs for all affected terminals. However, the port's electrical system serving Terminal X does provide adequate power to support Terminal X's shore power needs from 2010 thru 2017.			

Confidential ☐ **Yes** ☐ **No** **Port/Terminal** **POLA/Terminal X**

FORM 3
GRID-BASED SHORE POWER

Table 3D

Utility/Port Information - Grid-Based Shore Power
Based on your discussions with the Utility Provider and the port, identify the necessary infrastructure improvements to satisfy the 2010, 2012, 2014, 2017, and 2020 requirements as needed. Identify any specific improvements such as new power lines, additional transformers, substations, etc. Will modifications be made to an existing unit or will a new substation be required? Indicate when these improvements would be necessary with regard to satisfying the 2010, 2012, 2014, 2017, and 2020 requirements. Attach any additional sheets and indicate reference to Table 3D. *Please enter NA for Not Applicable if grid-based shore will not be used by 2010 or 2012.
2010*
No modifications necessary
2012*
No modifications necessary
2014 No modifications necessary
2017 No modifications necessary
2020 To satisfy the increased power needs for 2020 resulting from shore power and increased shipping activities, the utility will bring in an additional high voltage line to the existing Utility Substation. Construction for the B-Street substation upgrade is expected to begin in January 2014 and be completed by December, 2014. Refer to Chart 8. The port will bring a portion of this power to Terminals X, Y, and Z by adding an additional medium voltage line to the existing South Substation from the Utility Substation and adding an additional medium voltage line from the South Substation to Terminals X, Y, and Z. See Chart 6. The port plans to make the revisions to the South Substation and add the additional medium voltage lines beginning January 2015 and finishing December 2016, depending upon when both the CEQA documentation and related construction is completed.

Confidential ☐ **Yes** ☐ **No** **Port/Terminal** **POLA/Terminal X**

FORM 4
GRID-BASED SHORE POWER - EQUIVALENT EMISSIONS REDUCTION OPTION

Table 4A

2010 Estimate the categories of Vessels and Operators that are anticipated to visit this Terminal, how often they may visit, those that will use shore power, the number of visits that will use shore power, the typical berthing times and annual power use.

Vessel Operator	Vessel Category	Number of Vessels	Number of Vessel Visits	Number of Vessels That Will Use Shore Power	Number of Vessel Visits That Will Use Shore Power	Average Berthing Time, Hr	Total Estimated Annual Power Use, MW-Hr
Fast Shipping	Container	25	165	5	60	61	9,000
Total		25	165	5	60		9,000

Table 4B

2012 Estimate the categories of Vessels and Operators that are anticipated to visit this Terminal, how often they may visit, those that will use shore power, the number of visits that will use shore power, the typical berthing times and annual power use.

Vessel Operator	Vessel Category	Number of Vessels	Number of Vessel Visits	Number of Vessels that Will Use Shore Power	Number of Vessel Visits That Will Use Shore Power	Average Berthing Time, Hr	Total Estimated Annual Power Use, MW-Hr
Fast Shipping	Container	26	171	5	60	62	9,000
Total		26	171	5	60		9,000

Confidential ☐ **Yes** ☐ **No** **Port/Terminal** **POLA/Terminal X**

FORM 4
GRID-BASED SHORE POWER - EQUIVALENT EMISSIONS REDUCTION OPTION

Table 4C

2014 Estimate the categories of Vessels and Operators that are anticipated to visit this Terminal, how often they may visit, those that will use shore power, the number of visits that will use shore power, the typical berthing times and annual power use.

Vessel Operator	Vessel Category	Number of Vessels	Number of Vessel Visits	Number of Vessels that Will Use Shore Power	Number of Vessel Visits That Will Use Shore Power	Average Berthing Time, Hr	Total Estimated Annual Power Use, MW-Hr
Fast Shipping	Container	28	184	9	102	62	16,000
Total		28	184	9	102		16,000

Table 4D

2017 Estimate the categories of Vessels and Operators that are anticipated to visit this Terminal, how often they may visit, those that will use shore power, the number of visits that will use shore power, the typical berthing times and annual power use.

Vessel Operator	Vessel Category	Number of Vessels	Number of Vessel Visits	Number of Vessels that Will Use Shore Power	Number of Vessel Visits That Will Use Shore Power	Average Berthing Time, Hr	Total Estimated Annual Power Use, MW-Hr
Fast Shipping	Container	33	212	16	161	62	26,000
Total		33	212	16	161		26,000

Confidential ☐ **Yes** ☐ **No** **Port/Terminal** **POLA/Terminal X**

FORM 4
GRID-BASED SHORE POWER - EQUIVALENT EMISSIONS REDUCTION OPTION

Table 4E

2020 Estimate the categories of Vessels and Operators that are anticipated to visit this Terminal, how often they may visit, those that will use shore power, the number of visits that will use shore power, the typical berthing times and annual power use.

Vessel Operator	Vessel Category	Number of Vessels	Number of Vessel Visits	Number of Vessels that Will Use Shore Power	Number of Vessel Visits That Will Use Shore Power	Average Berthing Time, Hr	Total Estimated Annual Power Use, MW-Hr
Fast Shipping	Container	35	232	21	193	66	38,000
Total		35	232	21	193		38,000

Confidential ☐ **Yes** ☐ **No** **Port/Terminal** **POLA/Terminal X**

FORM 5
DISTRIBUTED GENERATION - EQUIVALENT EMISSIONS REDUCTION OPTION

Table 5A

2010 Estimate the categories of Vessels and Operators that are anticipated to visit this Terminal, how often they may visit, those that will use DG, and the number of visits that will use DG.

Vessel Operator	Vessel Category	Number of Vessels	Number of Vessel Visits	Number of Vessels That Will Use DG	Number of Vessel Visits That Will Use DG
Best	Container	7	47	1	10
Total		7	47	1	10

Table 5B

2012 Estimate the categories of Vessels and Operators that are anticipated to visit this Terminal, how often they may visit, those that will use DG, and the number of visits that will use DG.

Vessel Operator	Vessel Category	Number of Vessels	Number of Vessel Visits	Number of Vessels That Will Use DG	Number of Vessel Visits That Will Use DG
Best	Container	7	47	1	10
Total		7	47	1	10

FORM 5
DISTRIBUTED GENERATION - EQUIVALENT EMISSIONS REDUCTION OPTION

Table 5C

2014 Estimate the categories of Vessels and Operators that are anticipated to visit this Terminal, how often they may visit, those that will use DG, and the number of visits that will use DG.

Vessel Operator	Vessel Category	Number of Vessels	Number of Vessel Visits	Number of Vessels That Will Use DG	Number of Vessel Visits That Will Use DG
Best	Container	8	50	2	20
Total		8	50	2	20

Table 5D

2017 Estimate the categories of Vessels and Operators that are anticipated to visit this Terminal, how often they may visit, those that will use DG, and the number of visits that will use DG.

Vessel Operator	Vessel Category	Number of Vessels	Number of Vessel Visits	Number of Vessels That Will Use DG	Number of Vessel Visits That Will Use DG
Best	Container	10	57	4	34
Total		10	57	4	34

FORM 5
DISTRIBUTED GENERATION - EQUIVALENT EMISSIONS REDUCTION OPTION

Table 5E

2020 Estimate the categories of Vessels and Operators that are anticipated to visit this Terminal, how often they may visit, those that will use DG, and the number of visits that will use DG.					
Vessel Operator	**Vessel Category**	**Number of Vessels**	**Number of Vessel Visits**	**Number of Vessels That Will Use DG**	**Number of Vessel Visits That Will Use DG**
Best	Container	10	57	6	46
Total		10	57	6	46

FORM 5
DISTRIBUTED GENERATION - EQUIVALENT EMISSIONS REDUCTION OPTION

Table 5F

Distributed Generation Implementation					
	2010	**2012**	**2014**	**2017**	**2020**
Estimate the total number of DG units needed to serve the power needs in the following years	1	1	1	1	1

Provide information on the utilization of the anticipated DG units that will satisfy the future requirements. Identify the berths where the equipment is expected to be used, the type of DG unit (i.e. the type of equipment, the type of fuel used, etc), the maximum power at the berth, the amount of power that will be needed on an annual basis, and the units' annual fuel use. Please provide estimates for years 2010, 2012, 2014, 2017, and 2020. Attach any additional sheets and indicate reference to Table 5F.

	Berth	**Type of DG Unit**	**Maximum Power Need at Berth (MW)**	**Annual Power Use (MW-Hr)**	**DG Unit Annual Fuel Use**	**Fuel Units**
2010	2	Natural gas generator	2.5	1,500	200,000	gallons
	Berth	**Type of DG Unit**	**Maximum Power Need at Berth (MW)**	**Annual Power Use (MW-Hr)**	**DG Unit Annual Fuel Use**	**Fuel Units**
2012	2	Natural gas generator	2.5	1,500	200,000	gallons
	Berth	**Type of DG Unit**	**Maximum Power Need at Berth (MW)**	**Annual Power Use (MW-Hr)**	**DG Unit Annual Fuel Use**	**Fuel Units**
2014	2	Natural gas generator equipped with SCR	2.5	2,600	350,000	gallons
	Berth	**Type of DG Unit**	**Maximum Power Need at Berth (MW)**	**Annual Power Use (MW-Hr)**	**DG Unit Annual Fuel Use**	**Fuel Units**
2017	2	Natural gas generator equipped with SCR	2.5	4,000	550,000	gallons

FORM 5
DISTRIBUTED GENERATION - EQUIVALENT EMISSIONS REDUCTION OPTION

Table 5F continued

Distributed Generation						
Provide information on the utilization of the anticipated DG units that will satisfy the future requirements. Identify the berths where the equipment is expected to be used, the type of DG unit (i.e. the type of equipment, the type of fuel used, etc), the maximum power at the berth, the amount of power that will be needed on an annual basis, and the units' annual fuel use. Please provide estimates for years 2010, 2012, 2014, 2017, and 2020. Attach any additional sheets and indicate reference to Table 5F.						
2020	**Berth**	**Type of DG Unit**	**Maximum Power Need at Berth (MW)**	**Annual Power Use (MW-Hr)**	**DG Unit Annual Fuel Use**	**Fuel Units**
	2	Natural gas generator equipped with SCR	2.5	5,200	710,000	gallons

Table 5G

Terminal Plan - Distributed Generation Emission Reductions	
Please provide estimates of **baseline** and **post-baseline** NOx and PM emission reduction estimates for years 2010, 2012, 2014, 2017, and 2020. Include documentation supporting the anticipated reductions. Attach any additional sheets and indicate reference to Table 5G.	
2010	**Baseline NOx: 22.9 TPY Baseline PM: 0.41 TPY** **Post Baseline NOx 4.3 TPY Post Baseline PM: 0.02 TPY**
2012	**Baseline NOx: 22.9 TPY Baseline PM: 0.41 TPY** **Post Baseline NOx 4.3 TPY Post Baseline PM: 0.02 TPY**
2014	**Baseline NOx: 39.3 TPY Baseline PM: 0.71 TPY** **Post Baseline NOx 2.6 TPY Post Baseline PM: 0.04 TPY**
2017	**Baseline NOx: 62.5 TPY Baseline PM: 1.12 TPY** **Post Baseline NOx 4.3 TPY Post Baseline PM: 0.06 TPY**
2020	**Baseline NOx: 93.5 TPY Baseline PM: 1.68 TPY** **Post Baseline NOx 6.4 TPY Post Baseline PM: 0.09 TPY**

Confidential ☐ **Yes** ☐ **No** **Port/Terminal** **POLA/Terminal X**

FORM 7
VESSEL-SIDE ALTERNATIVE CONTROL – EQUIVALENT EMISSION REDUCTION OPTION

Table 7A

2010 Estimate the categories of Vessels and Operators that are anticipated to visit this Terminal, how many Vessels and how many total Vessel visits, those that will use vessel-side alternative controls and how many visits these Vessels will make.

Vessel Operator	Vessel Category	Number of Vessels	Number of Vessel Visits	Number of Vessels That Will Use Vessel-Side Controls	Number of Vessel Visits That Will Use Vessel-Side Controls
Golden Gate	Container	7	16	0	0
Total		7	16	0	0

Table 7B

2012 Estimate the categories of Vessels and Operators that are anticipated to visit this Terminal, how many Vessels and how many total Vessel visits, those that will use vessel-side alternative controls and how many visits these Vessels will make.

Vessel Operator	Vessel Category	Number of Vessels	Number of Vessel Visits	Number of Vessels That Will Use Vessel-Side Controls	Number of Vessel Visits That Will Use Vessel-Side Controls
Golden Gate	Container	7	16	0	0
Total		7	16	0	0

Confidential ☐**Yes** ☐ **No** **Port/Terminal** **POLA/Terminal X**

FORM 7
VESSEL-SIDE ALTERNATIVE CONTROL – EQUIVALENT EMISSION REDUCTION OPTION

Table 7C

2014 Estimate the categories of Vessels and Operators that are anticipated to visit this Terminal, how many Vessels and how many total Vessel visits, those that will use vessel-side alternative controls and how many visits these Vessels will make.					
Vessel Operator	**Vessel Category**	**Number of Vessels**	**Number of Vessel Visits**	**Number of Vessels That Will Use Vessel-Side Controls**	**Number of Vessel Visits That Will Use Vessel-Side Controls**
Golden Gate	Container	8	17	1	4
Total		8	17	1	4

Table 7D

2017 Estimate the categories of Vessels and Operators that are anticipated to visit this Terminal, how many Vessels and how many total Vessel visits, those that will use vessel-side alternative controls and how many visits these Vessels will make.					
Vessel Operator	**Vessel Category**	**Number of Vessels**	**Number of Vessel Visits**	**Number of Vessels That Will Use Vessel-Side Controls**	**Number of Vessel Visits That Will Use Vessel-Side Controls**
Golden Gate	Container	8	19	4	13
Total		8	19	4	13

Confidential ☐**Yes** ☐ **No** **Port/Terminal** **POLA/Terminal X**

FORM 7
VESSEL-SIDE ALTERNATIVE CONTROL – EQUIVALENT EMISSION REDUCTION OPTION

Table 7E

2020 Estimate the categories of Vessels and Operators that are anticipated to visit this Terminal, how many Vessels and how many total Vessel visits, those that will use vessel-side alternative controls and how many visits these Vessels will make.					
Vessel Operator	**Vessel Category**	**Number of Vessels**	**Number of Vessel Visits**	**Number of Vessels That Will Use Vessel-Side Controls**	**Number of Vessel Visits That Will Use Vessel-Side Controls**
Golden Gate	Container	9	20	9	20
Total		9	20	9	20

FORM 7
VESSEL-SIDE ALTERNATIVE CONTROL – EQUIVALENT EMISSION REDUCTION OPTION

Table 7F

Vessel-Side Controls	2010	2012	2014	2017	2020
Estimate the number of vessel-side alternative control units needed to achieve the emission reduction goals in the following years	NA	NA	SCR 4 DPF 4	SCR 16 DPF 16	SCR 36 DPF 36
Provide estimates of **baseline** and **post-baseline** NOx and PM emission reduction estimates for years 2010, 2012, 2014, 2017, and 2020. Include documentation supporting the anticipated reductions. Attach any additional sheets and indicate reference to Table 7F.					
2010 NA					
2012 NA					
2014 Baseline NOx: 3.8 TPY Baseline PM: 0.07 TPY Post Baseline NOx 0.8 TPY Post Baseline PM: 0.001 TPY					
2017 Baseline NOx: 11.3 TPY Baseline PM: 0.22 TPY Post Baseline NOx 2.3 TPY Post Baseline PM: 0.003 TPY					
2020 Baseline NOx: 18.5 TPY Baseline PM: 0.35 TPY Post Baseline NOx 3.8 TPY Post Baseline PM: 0.004 TPY					

Table 7G

List and describe the utilization of the anticipated vessel-side alternative control units that will satisfy the future requirements. Please provide estimates for years 2010, 2012, 2014, 2017, and 2020. Please fill out a separate Table 7G submittal for each type of Vessel-side alternative control unit. Attach any additional sheets and indicate reference to Table 7G.
2010 NA – ships in fleet equipped with control systems will not visit this terminal
2012 NA – ships in fleet equipped with control systems will not visit this terminal
2014 Selective catalytic system (SCR) will be used to reduce NOx emissions. SCR refers to a catalyst based system, in conjunction with a reducing agent (urea), which applied to the exhaust from a ship's auxiliary engine will significantly reduces the emissions of NOx emissions from the engine. The expected reduction in NOx emissions is dependent upon the load of the engine and how much the load varies—higher levels of reduction are typically achieved for engines operating at a constant load. The average load for the ship's engines for a given visit is expected to vary from 30 to 80 percent of maximum output, depending upon the number of reefer containers carried by the ship. Based on the typical load profiles (attached) and the results of emission tests (attached), the SCR system is expected to achieve an 80 percent in NOx.
2017 SCR will be used to reduce NOx emissions. See discussion above.
2020 SCR will be used to reduce NOx emissions. See discussion above.

Confidential ☐ **Yes** ☐ **No** **Port/Terminal** **POLA/Terminal X**

FORM 7
VESSEL-SIDE ALTERNATIVE CONTROL – EQUIVALENT EMISSION REDUCTION OPTION

Table 7F

Vessel-Side Controls	2010	2012	2014	2017	2020
Estimate the number of vessel-side alternative control units needed to achieve the emission reduction goals in the following years					
Provide estimates of **baseline** and **post-baseline** NOx and PM emission reduction estimates for years 2010, 2012, 2014, 2017, and 2020. Include documentation supporting the anticipated reductions. Attach any additional sheets and indicate reference to Table 7F.					
2010					
2012					
2014					
2017					
2020					

Table 7G

List and describe the utilization of the anticipated vessel-side alternative control units that will satisfy the future requirements. Please provide estimates for years 2010, 2012, 2014, 2017, and 2020. Please fill out a separate Table 7G submittal for each type of Vessel-side alternative control unit. Attach any additional sheets and indicate reference to Table 7G.
2010 NA – ships in fleet equipped with control systems will not visit this terminal
2012 NA – ships in fleet equipped with control systems will not visit this terminal
2014 Catalyzed particulate filters will be used to reduce particulate emissions. Particulate filters consists of a system that captures particulate emissions by filtration, and regenerates with the assistance of catalyst coating, which lowers the temperature of oxidation. The expected reduction in particulates is 99 percent. While the system has not been used on a ship auxiliary engine, the technology has been used successfully on large land-based engines greater than 2 MW in size. Golden Gate is currently demonstrating a particulate filter on two of their ships. The particulate filter has operated well without any operational issues. Source testing for the system should be available by early fall and will be submitted under separate cover.
2017 Particulate Filters will be used to reduce particulate emissions. See discussion above.
2020 Particulate Filters will be used to reduce particulate emissions. See discussion above.

Confidential ☐ **Yes** ☐ **No** **Port/Terminal** **POLA/Terminal X**

FORM 8
SCHEDULE FOR IMPLEMENTATION

The purpose of a Gantt chart (or similar planning software) is to provide details on when specific activities are planned to be implemented. Attach a Gantt chart for the planned schedule for all control technologies used. Please separate the utility provider, port, and terminal activities for each compliance option. Identify the critical elements in the schedule that may delay the implementation of the compliance solution. Include proposed contingency plans that can be implemented in the event that a delay in the schedule occurs.